Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong	NDS 144, 1 (2017)	1-Mar-2016

Q(β^-)=6896 *20*; S(n)=4814.7 *17*; S(p)=17893 *8*; Q(α)=−13390.9 *12* 2017Wa10

^{51}Ca Levels

Cross Reference (XREF) Flags

A	^{51}K β^- decay (365 ms)	E	U(p,X)
B	^{52}K β^-n decay (110 ms)	F	^{48}Ca(^{238}U,Xγ)
C	^{53}K β^-2n decay (30 ms)	G	^{238}U(^{48}Ca,Xγ)
D	^{48}Ca(^{18}O,^{15}O), (^{14}C,^{11}C)		

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	3/2$^{(-)}$	10.0 s *8*	AB DEFG	%β^-=100; %β^-n=? μ=−1.0496 *11* (2015Ru02) Q=+0.036 *12* (2015Ru02) J$^\pi$: Spin from hyperfine structure measurement (2015Ru02); parity from shell-model systematics. T$_{1/2}$: from γ multiscaling in 1980Hu14, 1981HuZT. μ: From collinear laser spectroscopy (CFBLS),^{43}Ca standard (2015Ru02). Q: From collinear laser spectroscopy (CFBLS),^{43}Ca standard (2015Ru02).
1240 *40*			D	
1718.0 *10*	(1/2$^-$)		B F	XREF: F(1721).
1940 *40*			D	
2378.06 *20*	(5/2$^-$)		B FG	J$^\pi$: Configuration=$\nu p^2_{3/2}\otimes\nu p_{1/2}$ (2008Fo01).
2934.1 *10*	(3/2$^-$)		B F	
3462.13 *20*	(7/2$^-$)		AB FG	XREF: F(3437). J$^\pi$: From shell-model predictions and systematics of odd-odd Ca isotopic chain. Configuration=$\nu p^4_{3/2}\otimes\nu f^{-1}_{7/2}$ (2008Fo01).
3477.5 *23*	(5/2$^-$)		F	
3500.9 *9*			B	
3580 *40*			D	
3844.1 *3*	(7/2$^+$)		FG	J$^\pi$: Configuration=$\pi[(f_{7/2})(s^{-1}_{1/2})]\otimes\nu p^{-1}_{3/2}$ (2008Fo01).
4040 *40*			D	
4155.1 *7*	(9/2$^+$)		G	J$^\pi$: Configuration=$\pi[(f_{7/2})(s^{-1}_{1/2})]\otimes\nu p^{-1}_{3/2}$ (2008Fo01).
4320.1 *4*	(9/2$^-$)		FG	J$^\pi$: Configuration=$\nu p^2_{3/2}\otimes\nu f_{5/2}$ (2008Fo01).
4493.1 *15*			B	
5678 *34*			A	
6684 *34*			A	
6776 *38*			A	
7060 *55*			A	E(level): 7040-7100, two closely spaced levels.
7420 *55*			A	
811×10^1 *10*			A	E(level): 8080-8180, two closely spaced levels.
8360 *30*			A	
8620 *30*			A	
8820 *46*			A	
905×10^1 *10*			A	E(level): 8980-9110, three closely spaced levels.
9330 *64*			A	E(level): 9320-9330, two closely spaced levels.
959×10^1 *12*			A	
9700 *64*			A	E(level): 9700-9703, two closely spaced levels.
982×10^1 *15*			A	E(level): 9780-9840, two closely spaced levels.
1034×10^1 *13*			A	E(level): 10300-10450, two closely spaced levels.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{51}Ca Levels (continued)

E(level)†	XREF
1067×10[1] *12*	A
1089×10[1] *10*	A

† For bound states connected by gammas, E(level)′s are from adopted γ radiations, using least-squares fit to data, except as noted. For unbound levels, calculated using S(n) (^{51}Ca)= 4814.4 *17* (2017Wa10), the measured energies of delayed neutrons (2006Pe16), taking into account the recoil energy of the final nucleus.

‡ As proposed in 2008Fo01 based on comparisons of γ-decays with shell-model calculations in ^{238}U(^{48}Ca,xγ), except as noted.

γ(^{51}Ca)

E_i(level)	J_i^π	E_γ†	I_γ‡	E_f	J_f^π	Comments
1718.0	(1/2$^-$)	1718 *1*	100	0.0	3/2$^{(-)}$	E_γ: Other: 1721.0 *17* in ^{48}Ca(^{238}U,Xγ).
2378.06	(5/2$^-$)	2378.0 *2*	100	0.0	3/2$^{(-)}$	E_γ,I_γ: from ^{238}U(^{48}Ca,Xγ).
						E_γ: Others: 2379.0 *13* in ^{48}Ca(^{238}U,Xγ), 2377 *1* in ^{51}K β^-n decay.
2934.1	(3/2$^-$)	2934 *1*	100	0.0	3/2$^{(-)}$	E_γ: Other: 2937 *5* in ^{48}Ca(^{238}U,Xγ).
3462.13	(7/2$^-$)	3462.0 *2*	100	0.0	3/2$^{(-)}$	E_γ,I_γ: from ^{238}U(^{48}Ca,xγ).
						E_γ: Others: 3437 *6* in ^{48}Ca(^{238}U,Xγ), 3460 *2* in ^{51}K β^-n decay.
3477.5	(5/2$^-$)	3479 *4*	100	0.0	3/2$^{(-)}$	E_γ,I_γ: from ^{48}Ca(^{238}U,Xγ).
3500.9		1123 *1*	11 *2*	2378.06	(5/2$^-$)	
		3500 *2*	100 *11*	0.0	3/2$^{(-)}$	
3844.1	(7/2$^+$)	1466.0 *2*	100	2378.06	(5/2$^-$)	E_γ,I_γ: from ^{238}U(^{48}Ca,Xγ).
						E_γ: Other: 1466.3 *16* in ^{48}Ca(^{238}U,Xγ),
4155.1	(9/2$^+$)	311.0 *6*		3844.1	(7/2$^+$)	E_γ,I_γ: from ^{238}U(^{48}Ca,Xγ).
		693.0# *6*		3462.13	(7/2$^-$)	E_γ,I_γ: from ^{238}U(^{48}Ca,Xγ).
4320.1	(9/2$^-$)	476.0 *4*		3844.1	(7/2$^+$)	E_γ: From ^{238}U(^{48}Ca,Xγ).
		843.4 *27*	1.5 *5*	3477.5	(5/2$^-$)	E_γ,I_γ: From ^{48}Ca(^{238}U,Xγ).
		1942.0 *4*	100 *50*	2378.06	(5/2$^-$)	E_γ,I_γ: From ^{48}Ca(^{238}U,Xγ).
						E_γ: Other: 1943 *6* in ^{48}Ca(^{238}U,Xγ).
4493.1		1559 *1*	100	2934.1	(3/2$^-$)	

† Eγ′s are from ^{51}K β^-n decay, except as noted.

‡ Relative photon branching from each level. Values from ^{51}K β^-n decay, except as noted.

Placement of transition in the level scheme is uncertain.

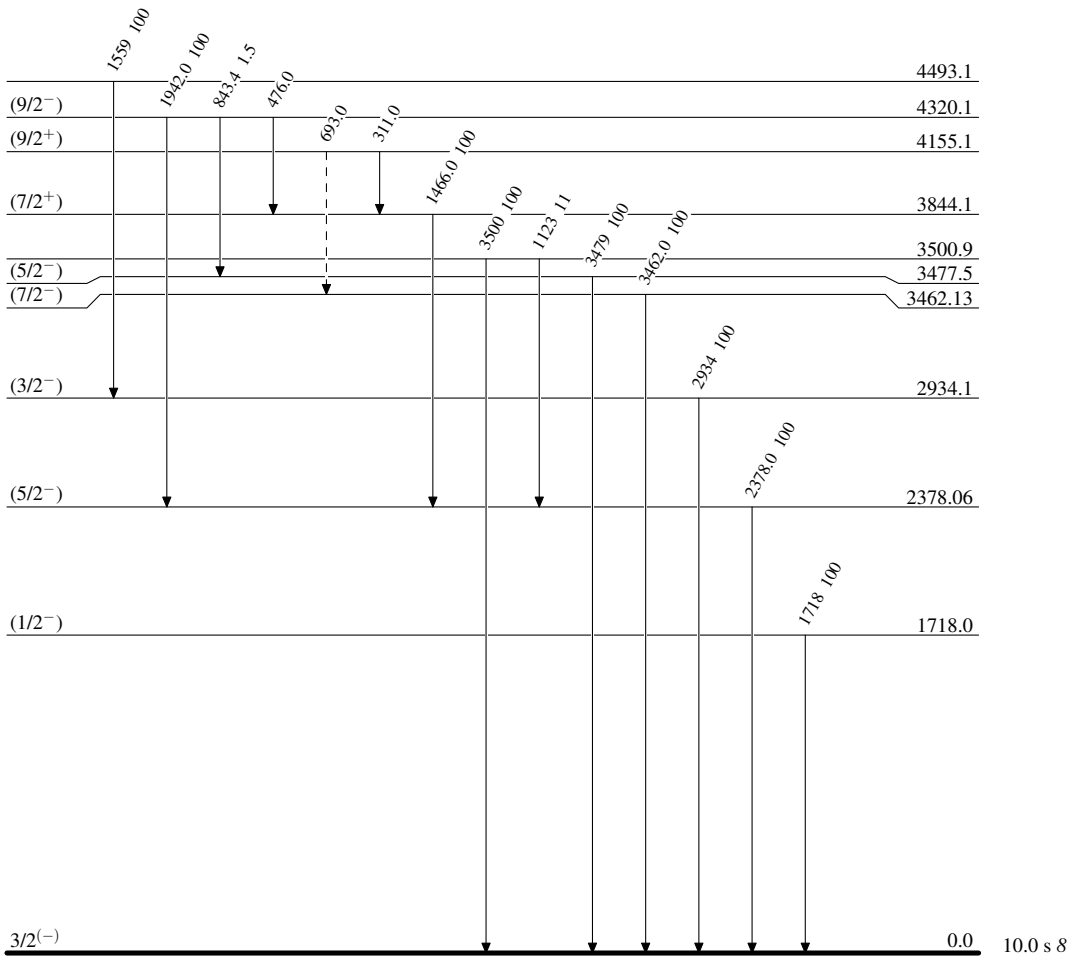
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{51}_{20}Ca_{31}$